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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/055,211	01/23/2002	Joseph A. Yedinak	90065.022702	5042

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EXAMINER

LANDAU, MATTHEW C

ART UNIT	PAPER NUMBER
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2815

DATE MAILED: 02/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/055,211

Applicant(s)

YEDINAK ET AL.

Examiner

Matthew Landau

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 November 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3,6,7,12-14,24,25,28,31-35,37-39,42 and 910 is/are pending in the application.
- 4a) Of the above claim(s) 3,6,7,9,24 and 39 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 10,12,25,28,31-33 and 42 is/are allowed.
- 6) ☒ Claim(s) 13,14,34,35 and 37 is/are rejected.
- 7) ☒ Claim(s) 38 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Drawings

The drawings were received on November 14, 2003. These drawings are acceptable.

Election/Restrictions

Claim 33, drawn to a non-elected species, has been withdrawn since claim 32, from which it depends, is allowable.

In view of the above noted withdrawal of the restriction requirement as to the linked species, applicant(s) are advised that if any claim(s) depending from or including all the limitations of the allowable generic linking claim(s) be presented in a continuation or divisional application, such claims may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application. Once a restriction requirement is withdrawn, the provisions of 35 U.S.C. 121 are no longer applicable. See *In re Ziegler*, 44 F.2d 1211, 1215, 170 USPQ 129, 131-32 (CCPA 1971). See also MPEP § 804.01.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 34 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 34 depends on a cancelled claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blanchard in view of the admitted prior art.

In regards to claims 13, Figures 1, 4, and 9 of Blanchard disclose buffer 39 and drift 37 layers doped with a second dopant, with the drift layer extending to a first surface; a base region 23 doped with the first dopant, the base region bordered by the drift layer, and the base region extending along said first surface to form a corresponding base stripe on said first surface; first and second source stripes 61 and 63 doped with the second dopant and located in the base stripe, said source stripes being spaced apart from and substantially parallel relative to each other, said source stripes extending in a substantially parallel manner relative to the base stripe; a body stripe defined between said source stripes; first and second channel regions, each of said channel regions extending across said base stripe from a corresponding one of said source stripes to said drift layer in a direction away from said body stripe; a respective gate oxide stripe 35 over each channel region; a respective conductive gate stripe 33 on each gate oxide stripe for controlling current through the corresponding channel; a respective insulating layer 35 over each conductive gate stripe, each insulating layer entirely covering a corresponding one of the source stripes; a source contact layer 29 extending through the insulating layer at a location between the

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conductive gate stripes; and a plurality of source contact regions 32 heavily doped with the second dopant, disposed in the body stripe and extending from the body stripe to at least one of the source stripes and in electrical contact with the source contact layer, said source contact regions spaced apart from each other along said body stripe and along said source stripes (see Figure 9). Figure 9 of Blanchard further discloses the source stripes are divided into a plurality of elongated source segments (1 and 97) spaced from each other along opposite sides of the body stripe, and portions of the body region extending between opposite ends of sequential segments to separate the sequential source stripe segments from each other. The source segments each have a length; therefore they have a predetermined length. The limitation “said predetermined lengths being dependent at least in part upon the proximity of said source segments to a center of the IGBT die” is a product-by-process limitation that does not structurally distinguish the product of the claimed invention over the prior art. *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). The difference between Blanchard and the claimed invention is a substrate heavily doped with a first dopant of one polarity. Figure 4A of the instant application discloses a P+ substrate connected to the buffer/drift layers. In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Blanchard by including a region heavily doped with first type dopants for the purpose forming a contact layer for the drain/collector, thereby making a functioning device.

In regards to claim 14, the limitation “wherein said predetermined lengths of said source segments are dependent upon a desired local SCIS current density” does not structurally distinguish the product of the claimed invention over the prior art. *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Claims 35 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blanchard in view of the admitted prior art and Korman et al. (US Pat. 5,119,153, hereinafter Korman).

In regards to claim 35, Figures 1, 4, and 9 of Blanchard disclose buffer 39 and drift 37 layers doped with a second dopant, with the drift layer extending to a first surface; a base region 23 doped with the first dopant, the base region bordered by the drift layer, and the base region extending along said first surface to form a corresponding base stripe on said first surface; first and second source stripes 61 and 63 doped with the second dopant and located in the base stripe, said source stripes being spaced apart from and substantially parallel relative to each other, said source stripes extending in a substantially parallel manner relative to the base stripe; a body stripe defined between said source stripes; first and second channel regions, each of said channel regions extending across said base stripe from a corresponding one of said source stripes to said drift layer in a direction away from said body stripe; a respective gate oxide stripe 35 over each channel region; a respective conductive gate stripe 33 on each gate oxide stripe for controlling current through the corresponding channel; a respective insulating layer 35 over each conductive gate stripe, each insulating layer entirely covering a corresponding one of the source stripes; a source contact layer 29 extending through the insulating layer at a location between the conductive gate stripes; and a plurality of source contact regions 32 heavily doped with the second dopant, disposed in the body stripe and extending from the body stripe to at least one of the source stripes and in electrical contact with the source contact layer, said source contact

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regions spaced apart from each other along said body stripe and along said source stripes (see Figure 9). Note that it is inherent to have some resistance in the source stripes. The difference between Blanchard and the claimed invention is a substrate heavily doped with a first dopant of one polarity. Figure 4A of the instant application discloses a P+ substrate connected to the buffer/drift layers. In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Blanchard by including a region heavily doped with first type dopants for the purpose forming a contact layer for the drain/collector, thereby making a functioning device. A further difference between Blanchard and the claimed invention is more than one base region. Figure 1 of Korman discloses a plurality of base regions 118 electrically connected. In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Blanchard by including more than one base region for the purpose of fabricating a high power device.

In regards to claim 37, Figure 9 of Blanchard discloses the source stripes (1 and 97) are sequentially segmented and sequential segments are separated from each other by the base region.

Allowable Subject Matter

Claim 38 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 10, 12, 25, 28, 31-33, and 42 are allowed.

Response to Arguments

Applicant's arguments filed November 14, 2003 have been fully considered but they are not persuasive.

In response to Applicant's arguments regarding claim 13 that the limitation in question is not a product-by-process limitation, the Examiner maintains that the limitation does not structurally distinguish the claimed invention. A process of making a product entails all steps involved in making that product, whether physical or otherwise. In this case, the limitation "said predetermined lengths being dependent at least in part upon the proximity of said source segments to a center of the IGBT die" is a decision step that determines the length of the source segments. This decision step is part of the process of making the product. However, a product could be made using different criteria to determine the source segment length and still end up with the same product. Applicant has not claimed that shorter segments are closer to the center, or even that the lengths of the source segments must differ. It appears Applicant is merely stating that the location on the die is taken into consideration when determining the source segment lengths. However, this determination is a process step. Therefore, the limitation is a product-by-process limitation that does not further structurally define the claimed invention. *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). This response similarly applies to the arguments made against the rejection of claim 14.

In response to Applicant's arguments regarding claim 35 that neither Blanchard or Korman disclose or suggest "a single insulating layer covering the source stripes, nor a single insulating layer covering the source strip having vias over the source contact regions", Figure 7c

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of Blanchard disclose an insulating layer 31 is deposited over the entire surface, including the source stripes. This insulating layer is subsequently etched to form vias in which source contact layer is deposited (Figure 7d). As can be seen from Figure 4, this insulating layer entirely covers the source stripes 63. Therefore, the device of Blanchard meets the aforementioned limitation.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew C. Landau whose telephone number is (571) 272-1731.

The examiner can normally be reached from 8:30 AM - 5:30 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached

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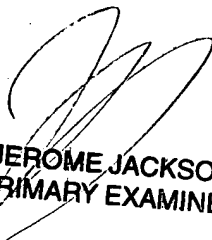
on (571) 272-1664. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Matthew C. Landau

Examiner

February 11, 2004



JEROME JACKSON
PRIMARY EXAMINER